

Innovation First, Inc.

(75 MHz) VEX Field Control System User Guide



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1. (75 MHz) Vex Field Controller System Overview

The (75 MHz) VEX Field Control system is used to control multiple Vex teams at a competition or scrimmage. It may control both 75 MHz transmitters only.

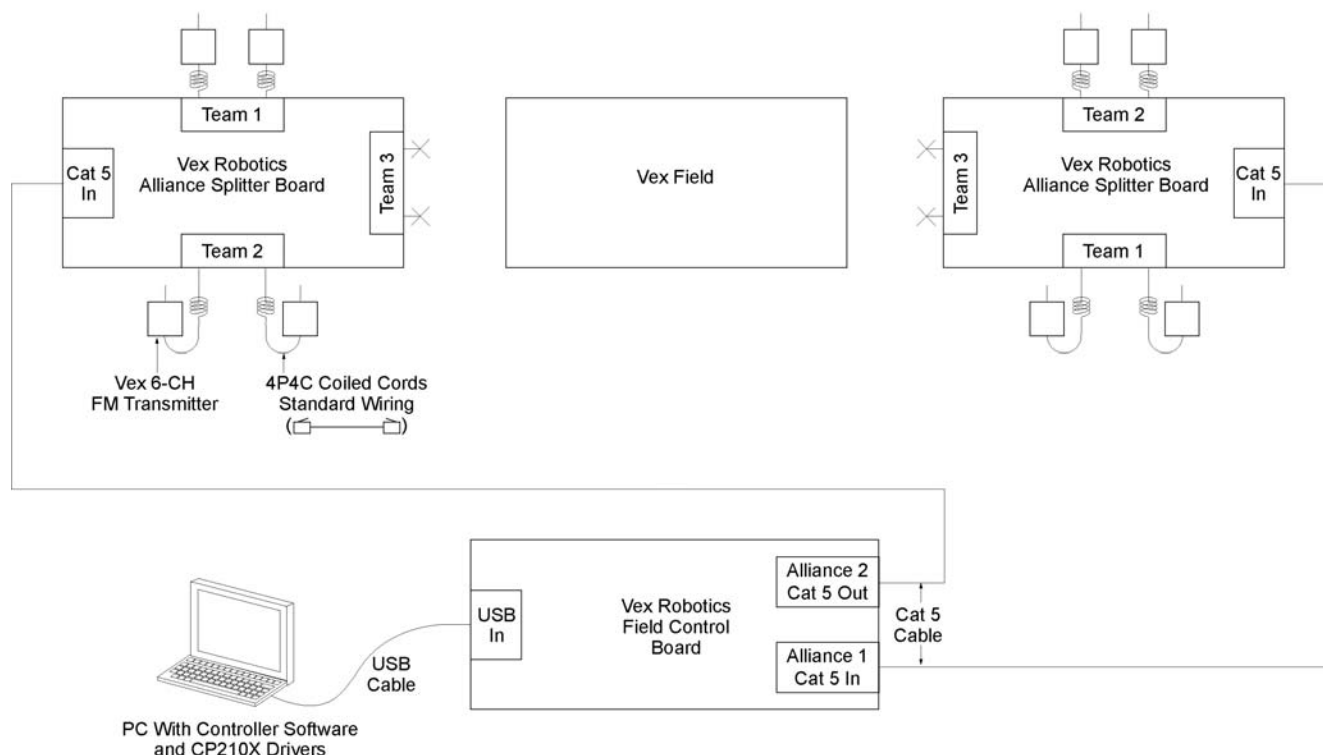
2. Software Installation

DO NOT attach the Field Control board to the PC unless you have first installed the VEX Field Control software and USB drivers per the Installation documentation. Currently the software is written for PC compatible machines running Microsoft Windows. Most testing has been done with Windows XP.

For ease of use, you may create an icon to put on the desktop for the VEX Field Control software. On the PC, click “start”, “All Programs” and navigate to the “Innovation First” call-out. The “VEX Field Control” short-cut will appear next to the arrow. Right click on “VEX Field Control” and click on “Create Shortcut”. Right click on the “VEX Field Control (2)” short cut you just created and drag it to your desktop. The name may be changed to eliminate the “(2)”.

3. Equipment Setup

Connect the Field Control equipment per the attached block diagram.

Vex Field Control Block Diagram

After the Vex Robotics Field Control Board is attached to the PC you may open the VEX Field Control software. Connect the VEX Alliance Splitter Boards to the Field Control Board using Ethernet cables. When the VEX Alliance Splitter board is plugged in, the associated Field Control Board LED will illuminate green. Otherwise it will illuminate red.

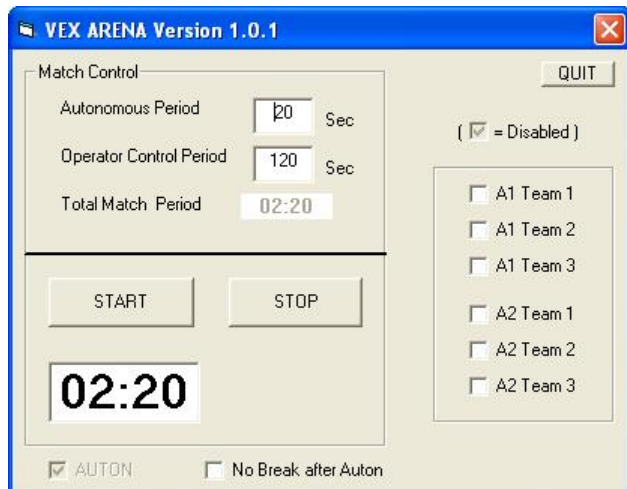
For 75 MHz competitions, connect 4P4C handset cables from the VEX Alliance Splitter to the associated VEX V.5 FM transmitters. If the competition has an autonomous period, the robot must be programmed with the associated template. Crystal management with the 75 MHz system is required to prevent frequency interference.

Refer to official game documentation for any over-riding or extra requirements.

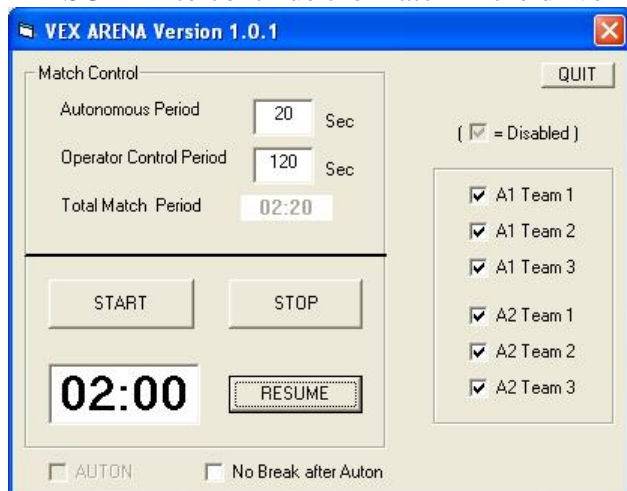
Open the VEX Field Control software. Change the Autonomous Period and Operator Control Period to match the game requirements. Leave the "No Break after Auton" unchecked unless you want the Vex robots to automatically continue operation after the end of the autonomous period.

4. Operation

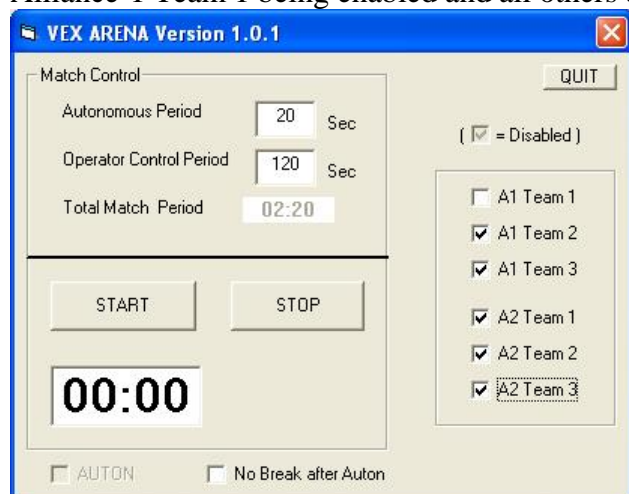
Click on “START” to start the match.



The following screen shot shows a match that has finished the 20 second autonomous period. Click on “RESUME” to continue the match in the driver control period.



The program allows you to independently enable and disable robots. Shown is a screen shot of Alliance-1 Team 1 being enabled and all others being disabled.



5. Theory of Operation

The VEX Field Control system typically sequences through the game in five states; Disabled, Autonomous, Disabled (for autonomous scoring), Driver Control, and Disabled (end of match).

The 75 MHz Vex robots must have a special software template to allow for this sequencing. The software template will put the Vex robots into autonomous mode for the first xx seconds after powering on and a valid transmitter output is received. The value xx is determined by the game requirement. After xx seconds has elapsed, the Vex robot software automatically goes into driver control mode. The VEX Field Control software turns on the 75 MHz Vex transmitter outputs during the Autonomous and Driver Control times. It disables the Vex transmitter outputs at all other times. Note that once autonomous starts, the robot does not receive the transmitter output until the autonomous template has finished. This means that robots running in autonomous can not be stopped by the field control system.

6. Normal Operation

TURN OFF all robots.

TURN OFF all transmitters.

Connect the Vex transmitters to the Alliance Splitter Boards with the provided cables.

Verify the VEX Field Control software timer is not running, or click STOP to turn off the timer.

TURN ON all robots. Place them in the starting position and configuration.

TURN ON all transmitters. If a robot moves, verify the 4P4C handset cable is properly attached to the transmitter.

Click on “START” on the VEX Field Control software to start the game.

Click on “RESUME” on the VEX Field Control software to resume the game after the autonomous period.

7. Debugging – General

Verify that the transmitter and robot batteries are fully charged.

Close the VEX Field Control software and reopen it if you have disconnected /reconnected the USB cable or if you started the software before connecting the Vex Robotics Field Control Board to the PC.

Make sure that no interfering tasks are running, such as the VEXnet Tournament Manager software. Also make sure there are no remnants of the VEX Field Controller and VEX Tournament Server in the notification area (typically the bottom right of the PC screen).

To check for a valid Autonomous / Driver mode template in the 75 MHz Vex robots, start with the Robot turned OFF. Do not connect the Vex transmitter to the Alliance Splitter Board. Turn on the Vex V.5 transmitter. Turn on the Robot. Try to drive the robot within the first xx seconds. If it moves then the template has not been programmed into the Vex. Reprogram the robot with the valid template.

If robot action is erratic

- Verify that the transmitter and robot batteries are fully charged.

- Verify that no two transmitters or receivers have the same crystal frequency.

- Verify the transmitter and respective receiver have the same crystal frequency.

- Verify that the competition crystals are being used. Someone in the pits may be using the default or Set A or Set B crystals.

- Verify that the (75 MHz) transmitter and receiver antennas are fully extended.

Appendix A: Document Version History

<u>Date</u>	<u>Code</u>	<u>Changes</u>
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2009-08-14		Initial document release.
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